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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,947	03/15/2004	Hassan Mostafavi		2915

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EXAMINER

KIKNADZE, IRAKLI

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/801,947

Applicant(s)

MOSTAFAVI ET AL.

Examiner

Irakli Kiknadze

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 14-27, 30-43 and 46-54 is/are rejected.
- 7) ☒ Claim(s) 12, 13, 28, 29, 44 and 45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3/6/2006</u>  | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. In response to the Office action dated September 20, 2006 the Amendment has been received on December 22, 2005.

Claims 51 and 54 have been amended.

Claims 1-54 are currently pending in this application.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-11, 14-27, 30-43 and 46-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Takagi et al. (US Patent 6,269,140 B1).

With respect to claims 1, 17 and 33, Takagi teaches a method, computer readable medium associated with a data processing section (20) and having a set of stored instruction, the execution of which causes a method to be performed (column 5, lines 45-62) and system for collecting computed tomography (CT) image data (while irradiating a portion of the patient with x-rays from an x-ray source disposed in a rotating gantry and detecting ones of the x-rays transmitted through the portion of the patient body to obtain image data)

Art Unit: 2882

comprising: covering one respiratory cycle in one gantry rotation and rotating the gantry to collect at set of CT image data of a lung of a patient, wherein one set of the CT image data corresponds to a phase of a respiratory cycle (column 7, lines 4-20; claims 13 and 17).

With respect to claims 2-5, 18-21 and 34-37, Takagi teaches repeating the step of rotating to start scanning of the portion of body of the patient at substantially same phase within the different respiratory cycles (column 7, lines 45-53).

With respect to claims 6-11, 22-27 and 38-43, Takagi teaches controlling a rotation speed of the gantry in accordance with the output signal of breathing phase of the patient (column 7, lines 5-20 and 42-50).

With respect to claims 14-16, 30-32 and 46-48, Takagi teaches generating motion data associated with a breathing of the patient. Further, method comprises synchronizing the collected CT image data and the motion data and sorting the collected CT image data such that CT image data that correspond to a same phase of a respiratory cycle are grouped for CT image reconstruction (column 7, lines 7-20; claims 13 and 17).

With respect to claim 49 and 52, Takagi teaches a method for generating a computed tomography (CT) image and computer readable medium associated with a data processing section (20) and having a set of stored instruction, the execution of which causes a method to be performed (column 5, lines 45-62), comprising: collecting data samples representative of a physiological movement of a patient due to breathing; covering one breathing cycle in one gantry rotation

Art Unit: 2882

and rotating the gantry to collect a set of CT image data of a lung of a patient (column 7, lines 4-20; claims 13 and 17).

With respect to claims 50 and 53, Takagi teaches controlling a speed of the gantry based on the data samples (column 7, lines 42-54).

With respect to claims 51 and 54, Takagi teaches that the generating the CT images comprises constructing a volumetric image (column 5, line 63 – column 6, line 9).

#### ***Allowable Subject Matter***

4. Claims 12, 13, 28, 29, 44 and 45 would be allowable if rewritten to independent form to include all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 12, prior art fails to teach or make obvious a method, for collecting computed tomography (CT) image data, comprising: determining a difference between a gantry phase and a determined breathing phase, wherein adjusting a speed of a gantry comprises changing the speed of the gantry rotation in response to the difference as claimed in combination with all elements of the base claim 1 and intervening claims 8 and 10.

With respect to claim 13, prior art fails to teach or make obvious a method, for collecting computed tomography (CT) image data, comprising: estimating a

Art Unit: 2882

next breathing phase of the patient based on the determined phase of the patient; and wherein the adjusting comprises changing the speed of the gantry rotation based on the estimated next breathing phase as claimed in combination with all elements of the base claim 1 and intervening claims 8 and 10.

With respect to claim 28, prior art fails to teach or make obvious a computer readable medium having a set of stored instruction, the execution of which causes a method to be performed, comprising: determining a difference between a gantry phase and the determined breathing phase, wherein adjusting a speed of a gantry comprises changing the speed of the gantry rotation in response to the difference as claimed in combination with all elements of the base claim 17 and intervening claims 24 and 26.

With respect to claim 29, prior art fails to teach or make obvious a computer readable medium having a set of stored instruction, the execution of which causes a method to be performed, comprising: estimating a next breathing phase of the patient based on the determined phase of the patient; and wherein the adjusting comprises changing the speed of the gantry rotation based on the estimated next breathing phase as claimed in combination with all elements of the base claim 17 and intervening claims 24 and 26.

With respect to claim 44, prior art fails to teach or make obvious a system for collecting computed tomography (CT) image data, comprising: determining a difference between a gantry phase and the determined breathing phase, wherein adjusting a speed of a gantry comprises changing the speed of the gantry

Art Unit: 2882

rotation in response to the difference as claimed in combination with all elements of the base claim 33 and intervening claims 40 and 42.

With respect to claim 45, prior art fails to teach or make obvious a system for collecting computed tomography (CT) image data, comprising: estimating a next breathing phase of the patient based on the determined phase of the patient; and wherein the adjusting comprises changing the speed of the gantry rotation based on the estimated next breathing phase as claimed in combination with all elements of the base claim 33 and intervening claims 40 and 42.

### ***Response to Arguments***

6. Applicant's arguments filed December 22, 2005 have been fully considered but they are not persuasive.

With respect to claim 1, applicant determines a number of intervals  $N$  into which a respiratory cycle is to be divided, determines a number of respiratory cycles  $m$  to be covered in one gantry rotation, and rotates a gantry to collect at least  $M \times N$  sets of CT image data of at least a portion of a patient, wherein each set of the CT image data corresponds to a phase of a respiratory cycle. Claims 17 and 33 recite similar limitations. Applicant fails to claim that  $N$  and/or  $M$  are any specific number: one, more than one, integer or non-integer number. Examiner used teaching of Takagi et al. (US Patent 6,269,140 B1) assuming that the number of intervals ( $N$ ) into which the respiratory cycle is to be divided and the number of respiratory cycle ( $M$ ) to be covered in one gantry rotations equals

Art Unit: 2882

to one. Following this understanding, Takagi teaches that "the x-ray scan speed in the lung region is controlled synchronously with the breath period of the lung to thereby obtain a clear CT image of the lung without any distortion" (column 7, lines 4-20) wherein the scan data is collected over a scan angle of 360 degrees within a single breathing cycle (claims 13 and 17). For that reason, Takagi teaches a method, computer readable medium associated with a data processing section (20) having a set of stored instruction, the execution of which causes a method to be performed (column 5, lines 45-62) and system for collecting computed tomography (CT) image data (while irradiating a portion of the patient with x-rays from an x-ray source disposed in a rotating gantry and detecting ones of the x-rays transmitted through the portion of the patient body to obtain image data) comprising: covering one respiratory cycle in one gantry rotation and rotating the gantry to collect at set of CT image data of a lung of a patient, wherein one set of the CT image data corresponds to a phase of a respiratory cycle (column 7, lines 4-20; claims 13 and 17).

With respect to claim 49, applicant determines a number of intervals  $N$  into which a breathing cycle is to be divided, and rotates a gantry at least  $N$  times to acquire data of at least a part of the patient. Claim 52 recites similar limitations. Applicant fails to claim that  $N$  is any specific number: one, more than one, integer or non-integer number. Examiner used teaching of Takagi et al. (US Patent 6,269,140 B1) assuming that the number of intervals ( $N$ ) into which the breathing cycle is to be divided equals to one. Following this understanding, Takagi teaches that the x-ray scan speed in the lung region is controlled synchronously



Art Unit: 2882

with the breath period of the lung to thereby obtain a clear CT image of the lung without any distortion (column 7, lines 4-20) wherein the scan data is collected over a scan angle of 360 degrees within a single breathing cycle (claims 13 and 17). For that reason, Takagi teaches a method and a computer readable medium associated with a data processing section (20) having a set of stored instruction, the execution of which causes a method to be performed (column 5, lines 45-62) (while irradiating a portion of the patient with x-rays from an x-ray source disposed in a rotating gantry and detecting ones of the x-rays transmitted through the portion of the patient body to obtain image data) comprising: one respiratory cycle to be covering one berating cycle in one gantry rotation and rotating the gantry to collect at set of CT image data of a lung of a patient (column 7, lines 4-20; claims 13 and 17).

### ***Conclusion***

**7. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

Art Unit: 2882

calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is 571-272-2493. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571-272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Irakli Kiknadze  
March 27, 2006

IK

  
**EDWARD J. GLICK**  
SUPERVISORY PATENT EXAMINER